

### Here and There—

a fairly accurate figure for fuel consumption can be obtained, but this is not a direct measurement.

From the viewpoint of safety the consumption meter has obvious advantages betraying, as it does, vapour locks and partially opened valves.

Briefly the operation system is as follows. A unit containing two metal bellows—one large and one small—is introduced into the pressure line from the fuel pump to the carburetter. A pressure-drop, depending for its magnitude on the velocity of the liquid, is created in this unit. It is arranged that this pressure-drop shows itself as an over-pressure which, in turn, is compensated for by an air pressure. This latter is actually the measuring medium for the velocity of the petrol flow and is read off on a sensitive manometer calibrated in gallons or litres per hour. A relatively small pressure-drop in the petrol flow actually gives rise to an air pressure fourteen times as large. The makers claim that when the force to be measured is applied, a compensating force acts at once, making the deformation of the bellows a small one.

Compressed air is often carried on large machines for the operation of wheel brakes and this, supplied through a reducing valve, could be utilised for the consumption meter. As an alternative the company has developed a small electrically-driven air compressor which uses only 8 watts and weighs no more than 2lb. A pressure of about 15lb. is desirable.

A system of pressure transformation similar to that used for the consumption meter has been applied to a fuel quantity gauge. In this the pressure head of petrol acts as the indicating force of the instrument, the force applied being proportional to the height of the fluid level in the tank. The diaphragm system, accordingly, is on the bottom of the fuel tank. The pressure gauge has an empiric calculation in pounds, kilograms, gallons or litres.

The manufacturers are Short and Mason, Ltd., Aneroid Works, Walthamstow, London, E.17.

### A Remarkable Plastic

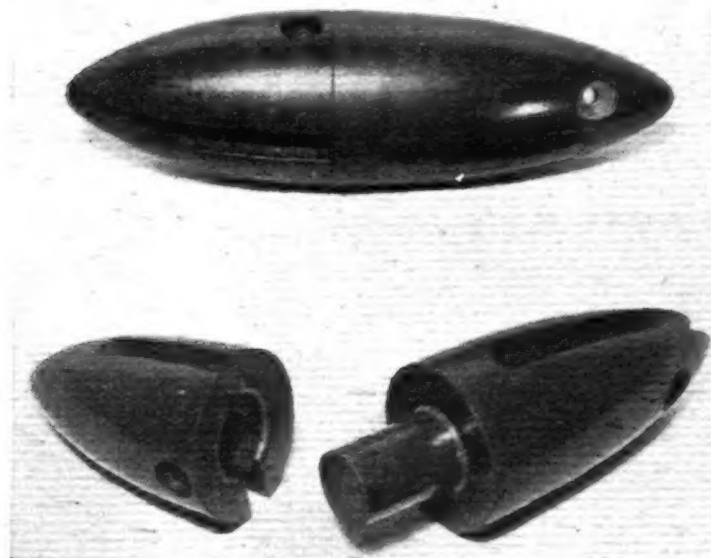
THE truly amazing physical qualities of modern plastic materials are well illustrated in "Tufnol," which is now being extensively used in aircraft work.

A homogenous electrical insulating material, "Tufnol" is described by its makers—Ellison Insulations, Ltd., Perry Barr, Birmingham, 20—as being half the weight of aluminium but equal in tensile strength.

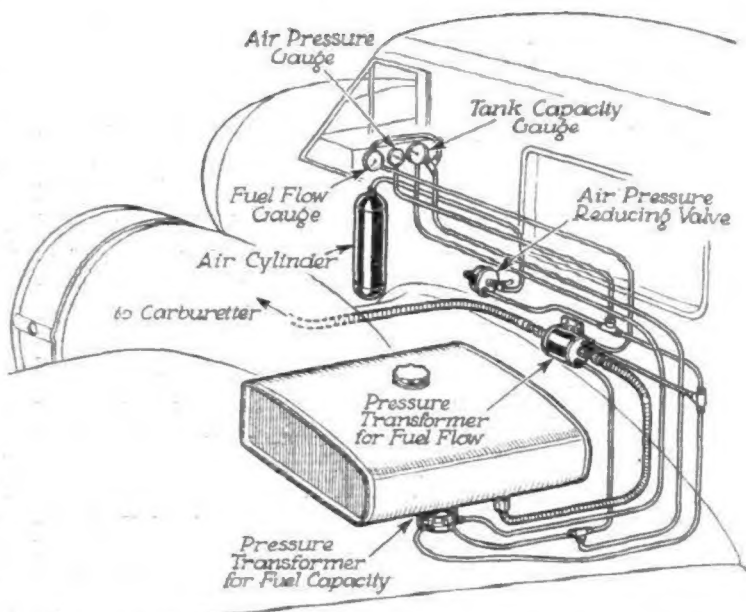
By way of example of its uses in aircraft construction may be mentioned "acorns" for bracing-wire intersections (it is being used for this purpose on the Heyford), control cable pulleys, fair leads, aerial lead-in tubes, radio components, certain retractable undercarriage parts, cam heels for distributors, and electrical insulation generally.

It is stated to be unaffected by climatic conditions and does not expand or contract under conditions of heat or cold. It is non-hygroscopic, and is not affected by fumes. Most mild acids and alkalis do not attack it, and its hardness and bitter resinous taste make it immune from the attacks of ants and rodents. It will not corrode and will not splinter under severe bumps or strain. Neither will it support a flame.

"Tufnol" is used in many industries for the manufacture



Bracing-wire acorns made of "Tufnol," some of the remarkable qualities of which are referred to above.



A hypothetical layout of the Short and Mason fuel indication system described in the adjacent column.

of quiet and resilient gear pinions, and for many other purposes—even for nuts and bolts, which fact gives some indication of its tensile strength.

The petrol pump valves of the D.H. Comets, incidentally, were made of "Tufnol." Such valves are stated to be unaffected by oil or fuel, by age, or by temperatures up to 212 deg. F. They do not swell or warp and are quiet in operation, light in weight, and durable.

"Tufnol" can be sawn, planed, punched, drilled, tapped, screwed and otherwise machined with ordinary tools, or during manufacture it can be moulded into almost any shape. It is produced by Ellison Insulations, Ltd., in eight different brands with distinctive properties, and is available in sheet, rod, tube, strip or special sections, or in any special moulding required.

### An Easy-maintenance Aircraft Battery

SOME very practical and interesting features distinguish a new type of Dagenite accumulator, designated the 6-DAII-B and intended for non-aerobatic civil aircraft.

Briefly, the outstanding points include a patented topping-up device to prevent over-filling and spilling of the electrolyte; accessibility for topping-up without disturbing the accumulator or removing its cover; and robust terminal connections arranged at one end of the battery and designed to accommodate sweated-in heavy-gauge cables.

The topping-up device is so ingenious that it merits description in full. In a tube screwed and "cemented" into the threaded centre boss of each cell lid is a tube accommodating the spindle of a level indicator or float. This float has a sealed air chamber at its base, and its spindle is provided with two circular guide collars and a valve-like top, which, when the float and spindle are in the fully "up" position, abuts against a similarly shaped seating at the top of the tube. The float, of low specific gravity, moves freely up and down the tube according to the height of the electrolyte.

The topping-up tubes, closed by knurled caps, are made long enough to protrude through the cover, which fits over the whole of the accumulator. Topping-up is therefore carried out without the necessity of either removing the battery cover or undoing the holding-down gear.

Distilled water is poured into each tube until the white top of the float spindle rises and cuts off any further supply, when a slight excess of water builds up in the cup-shaped top of the tube; this is a clear indication that the cell is full of electrolyte to the correct level. When the knurled cap is replaced a small projection on the inside depresses the float slightly and releases any trapped liquid into the cell.

Any water inadvertently poured on to the top of the tube after the float has "shut off" runs down the outside of the tube into the wells formed by recessing the cell lids well below the level of the container walls and partitions. These wells hold any excess liquid until it is dispersed by evaporation.

This accumulator is made in the 12-volt type, with a capacity of 26 amp. hrs. at a 20-hour rate of discharge. The weight is 34lb., including acid, and the price £6 15s. 6d.

The makers are Peto and Radford, 50, Grosvenor Gardens, London, S.W.1.